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Timson

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[45] Date of Patent: Sep. 1, 1992

[54] **CAN CONSTRUCTION**

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[73] Assignee: **Wellesley Research Associates, Inc.**, Wellesley, Mass.

[21] Appl. No.: **722,525**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 606,564, Oct. 31, 1990, Pat. No. 5,027,968.

[51] **Int. Cl.**[5] **B65D 17/00**

[52] **U.S. Cl.** **220/260**; 220/269; 220/277

[58] **Field of Search** 220/269, 268, 285, 375, 220/379, 260, 277; 215/289, 306

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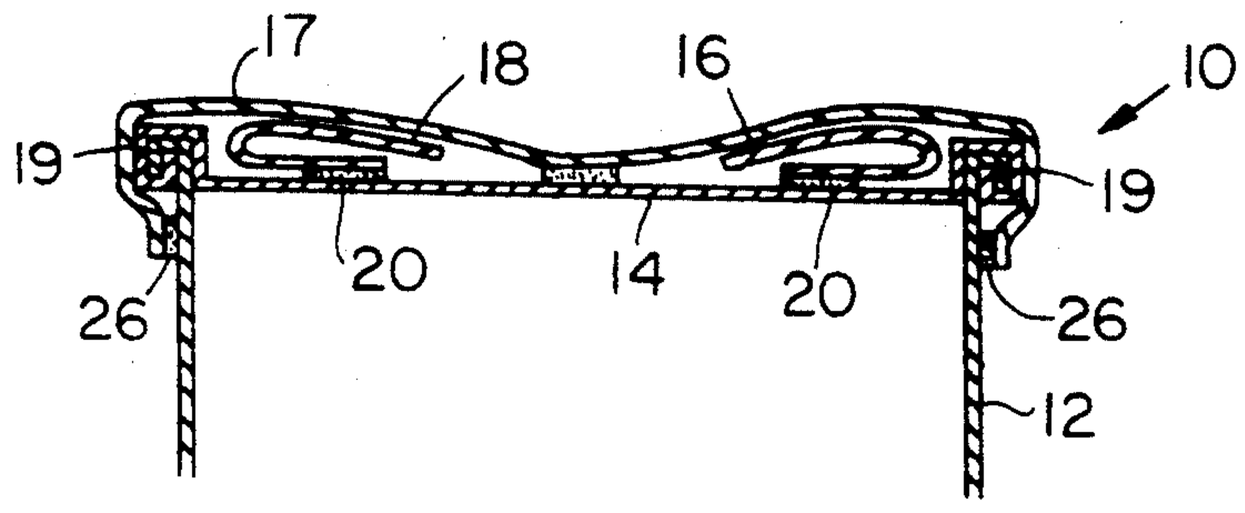
Primary Examiner—Steven M. Pollard
Attorney, Agent, or Firm—Paul J. Cook

[57] **ABSTRACT**

A container is provided with a top to which is secured at least one strip. The strip or strips are provided with a prestress bias so that when the top is severed from the container, the strip or strips are lifted away from the top and over the container rim so that the strip can be grasped easily to provide a means for lifting the top away from the container.

24 Claims, 4 Drawing Sheets



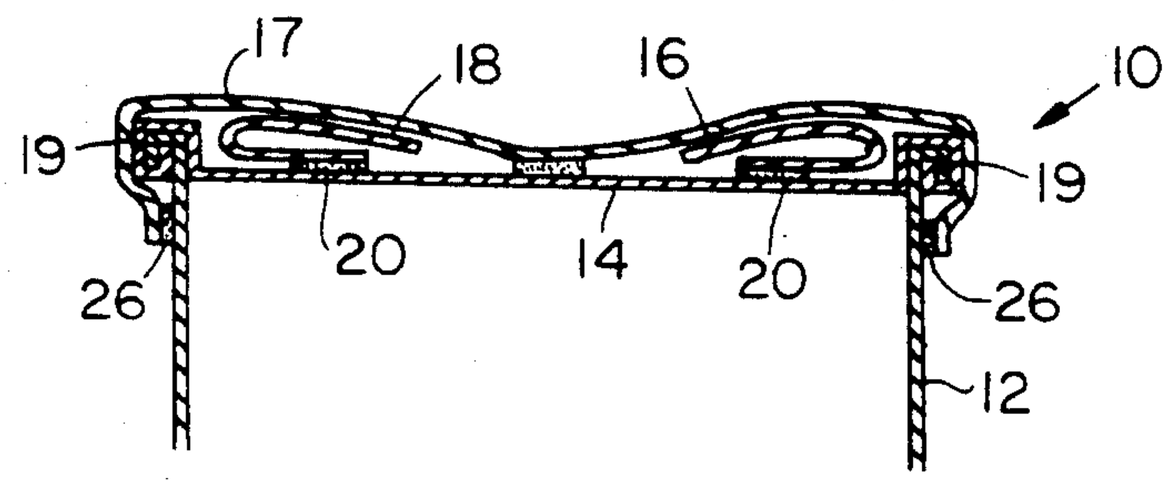


FIG. 1

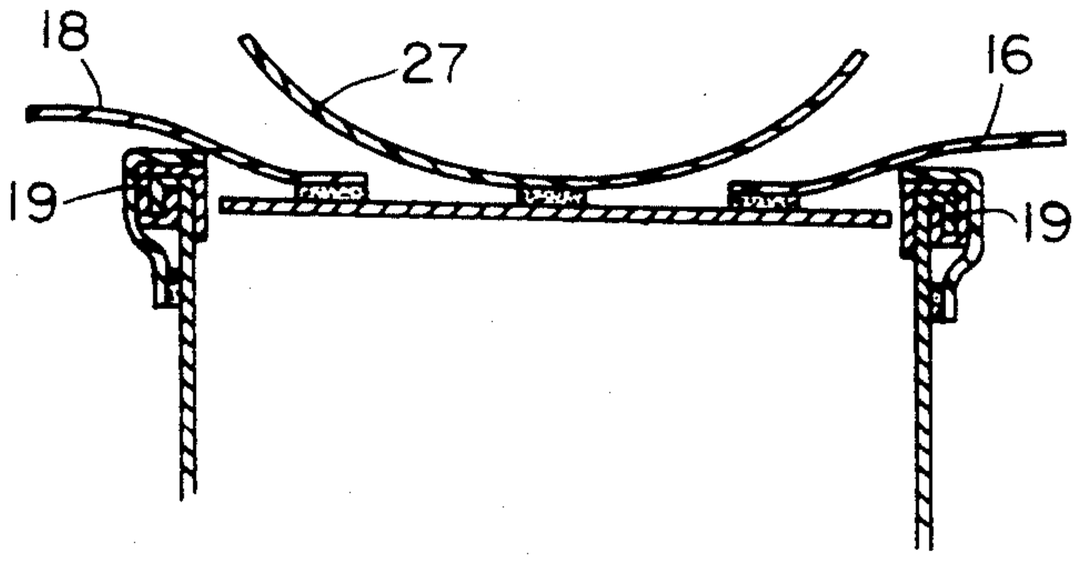


FIG. 2

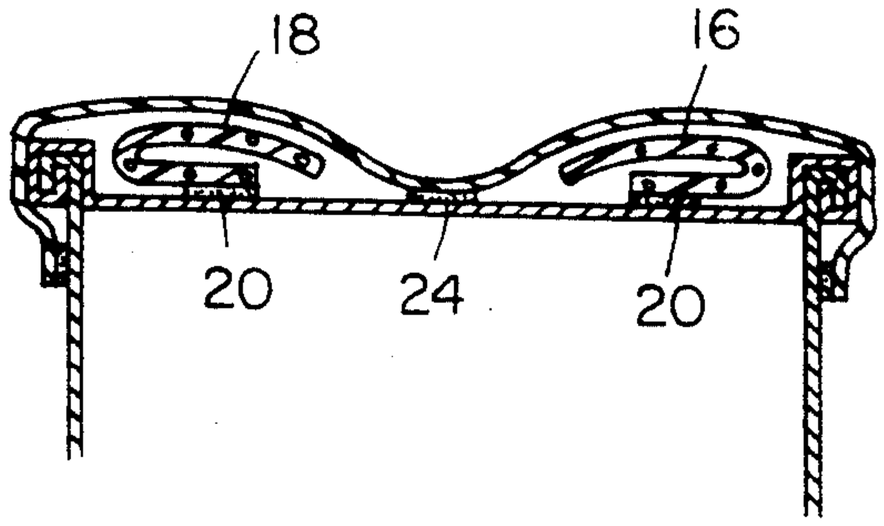


FIG. 3

FIG. 4

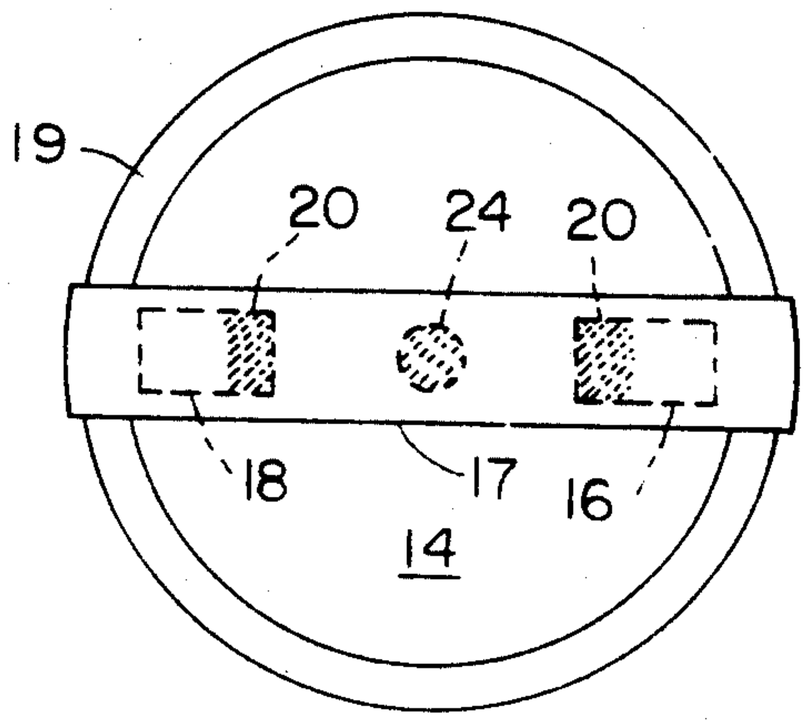


FIG. 5

FIG. 7

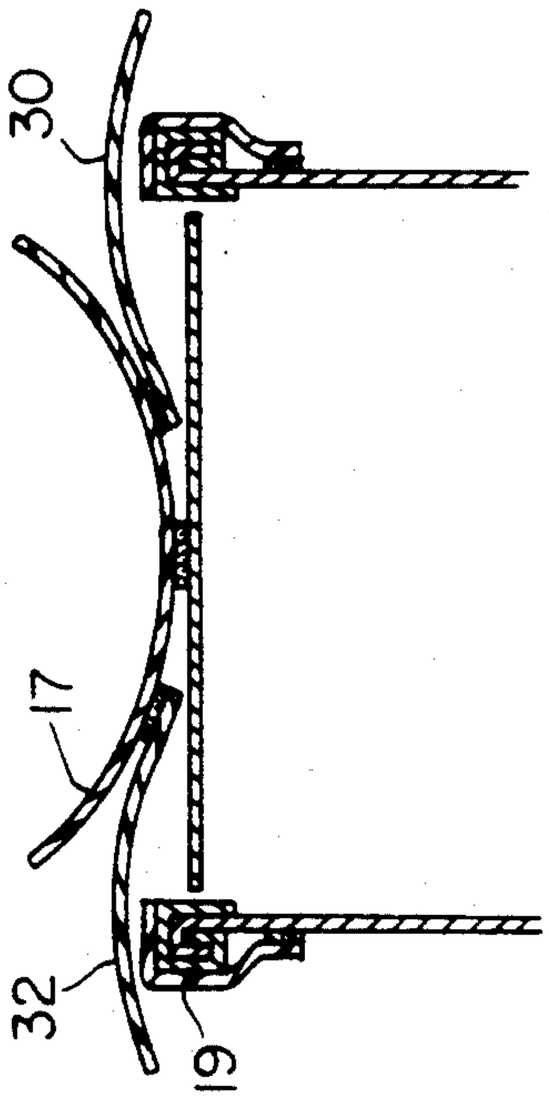


FIG. 9

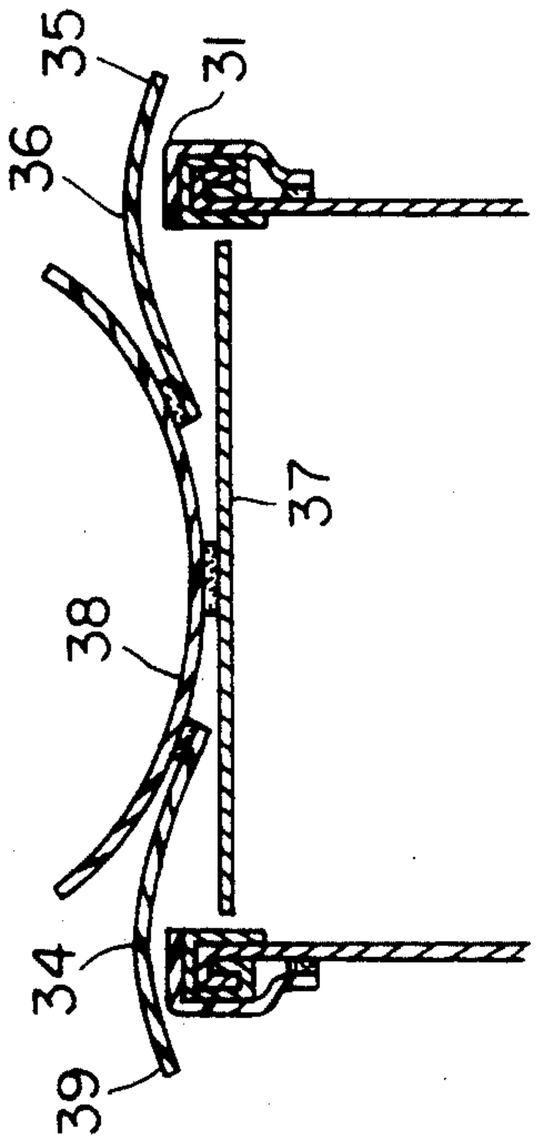
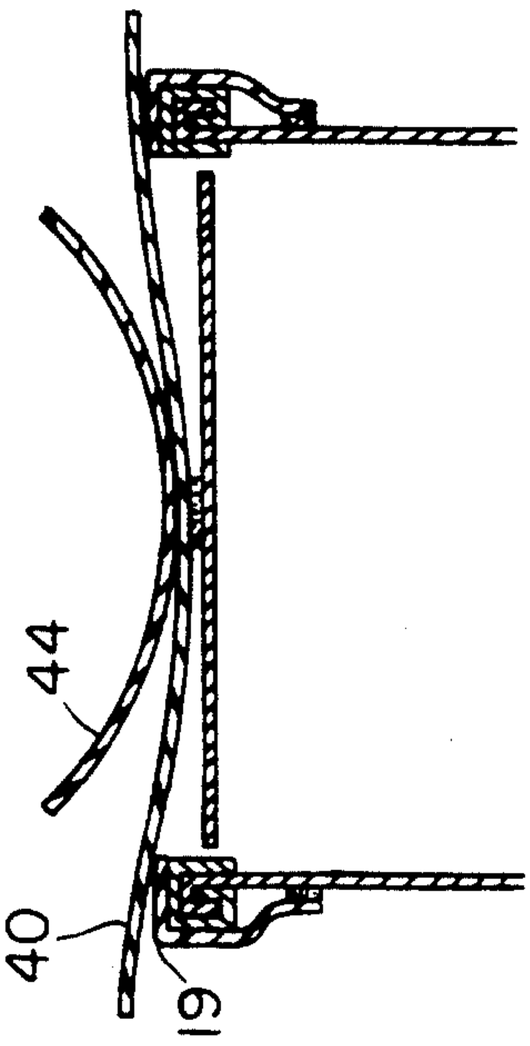


FIG. 11



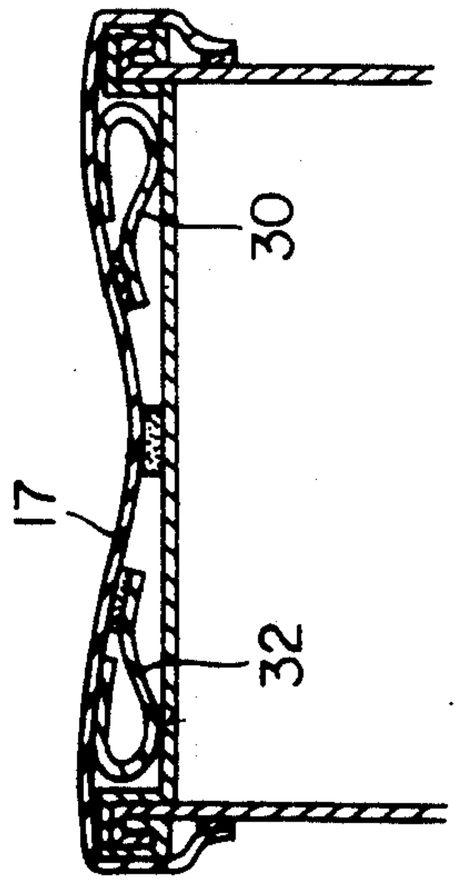


FIG. 6

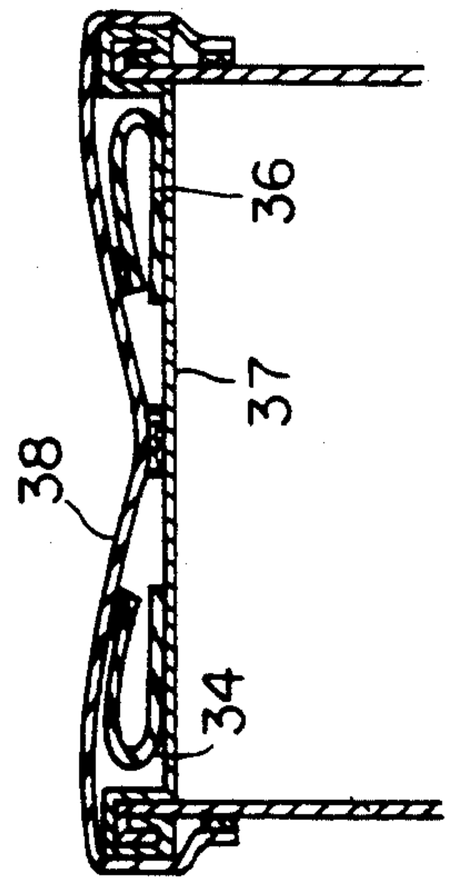


FIG. 8

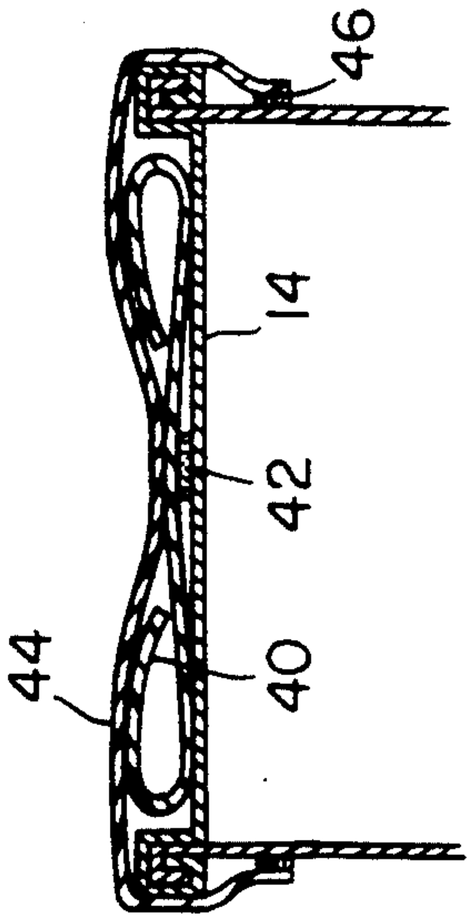


FIG. 10

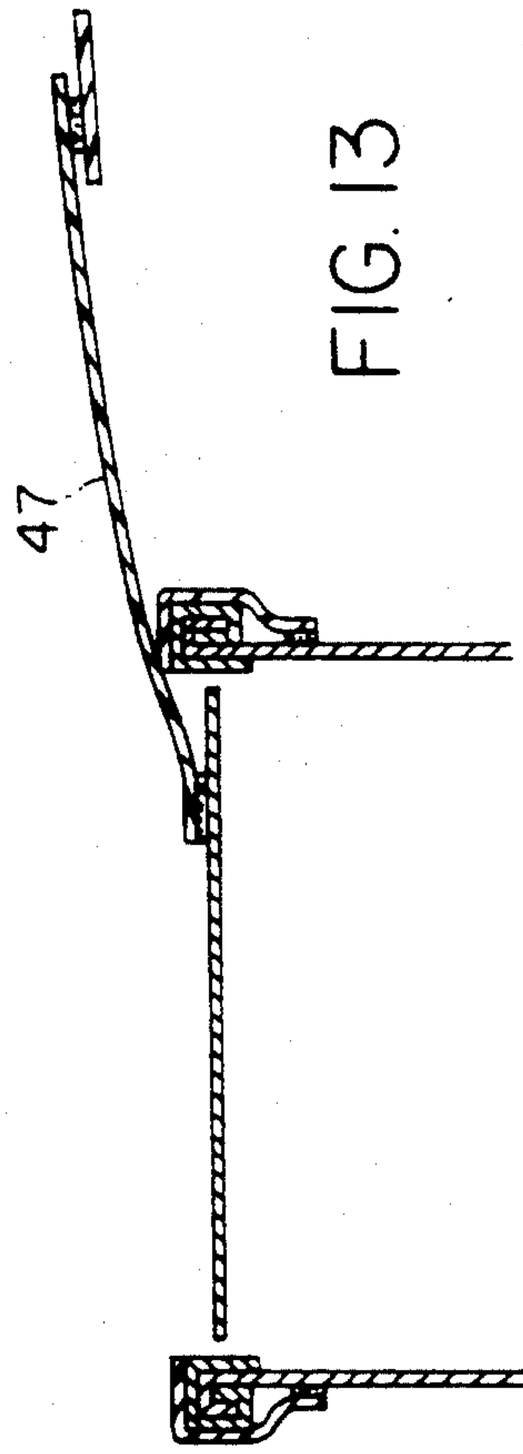


FIG. 13

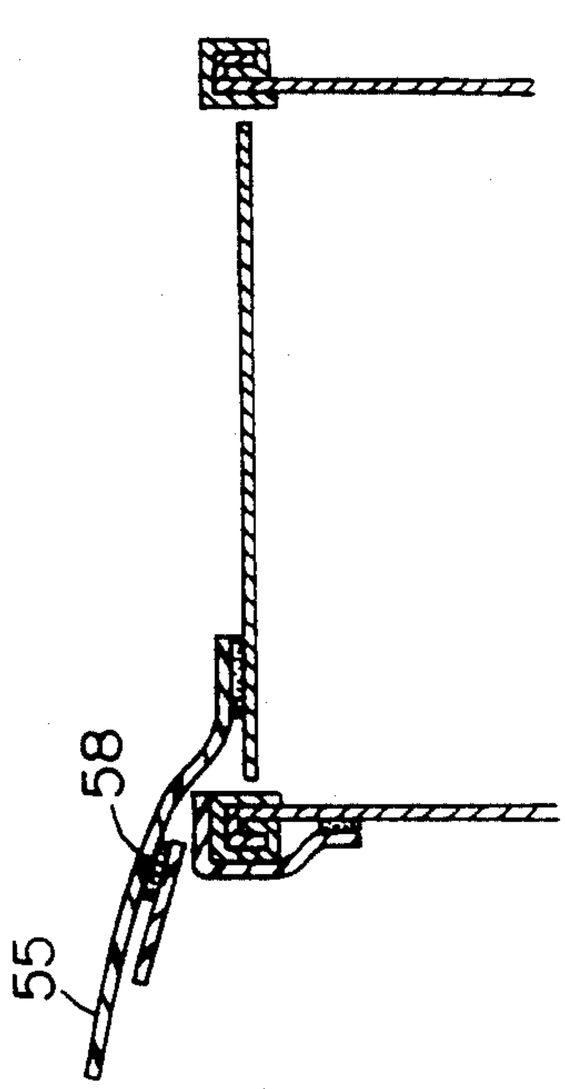


FIG. 15

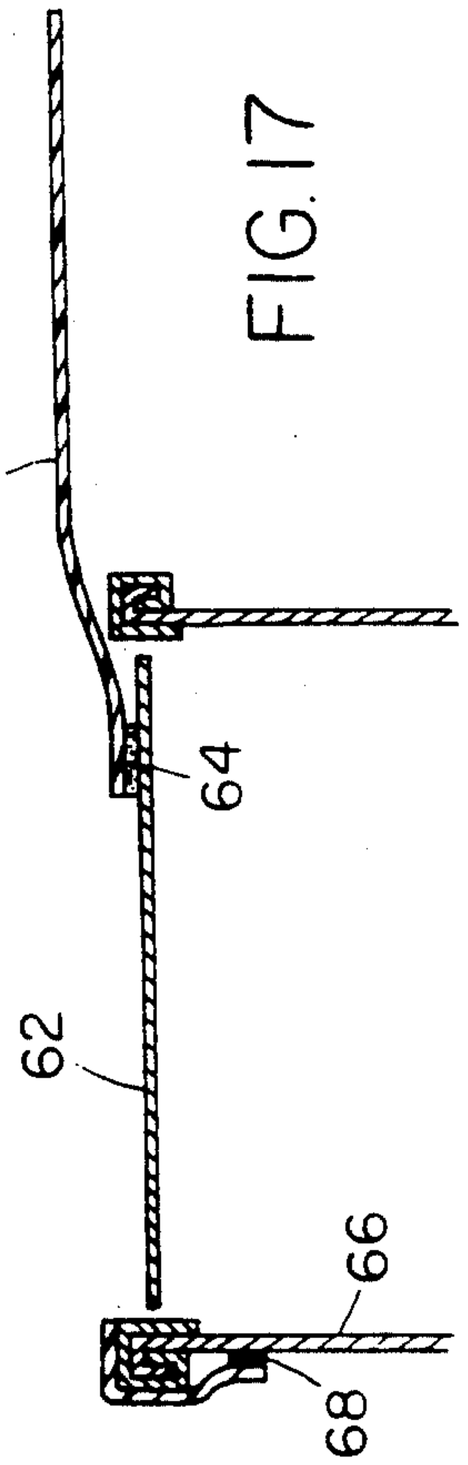


FIG. 17

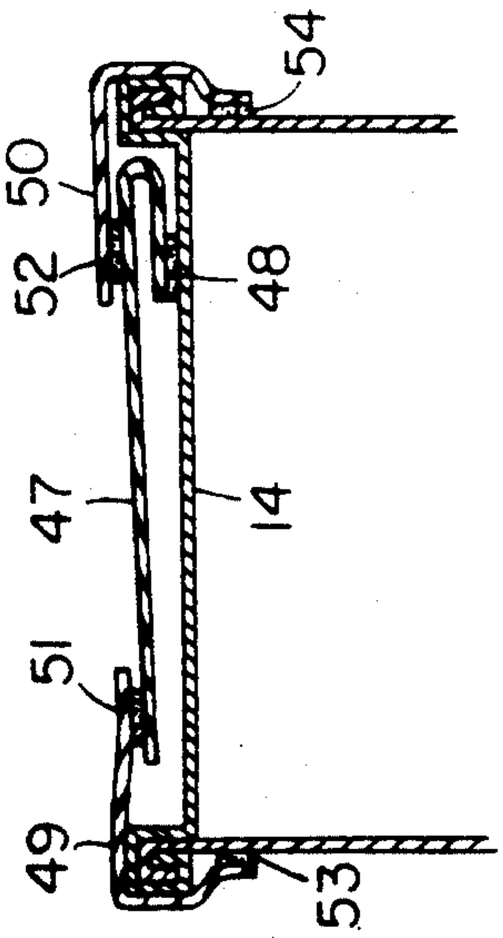


FIG. 12

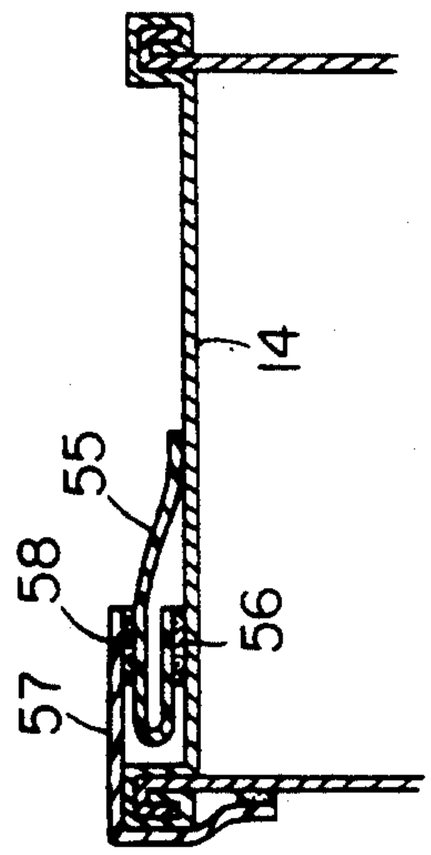


FIG. 14

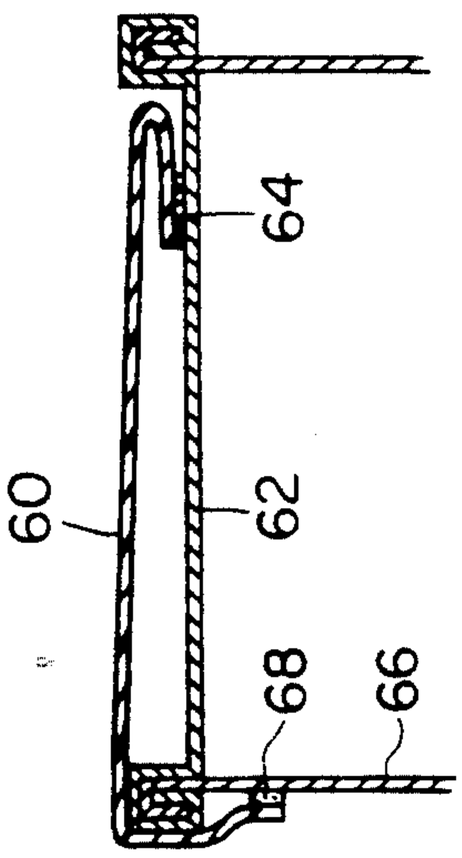


FIG. 16

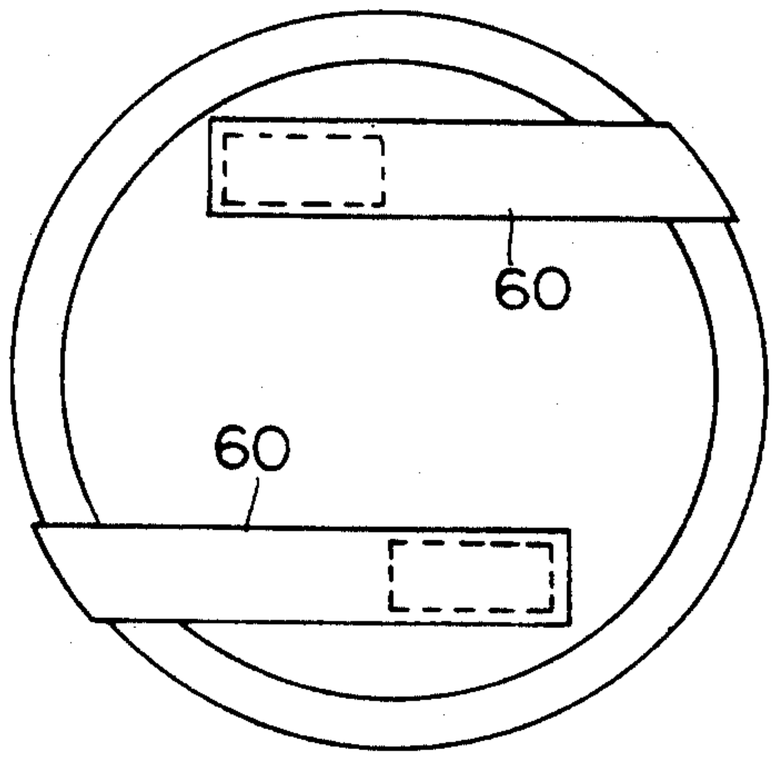


FIG. 18

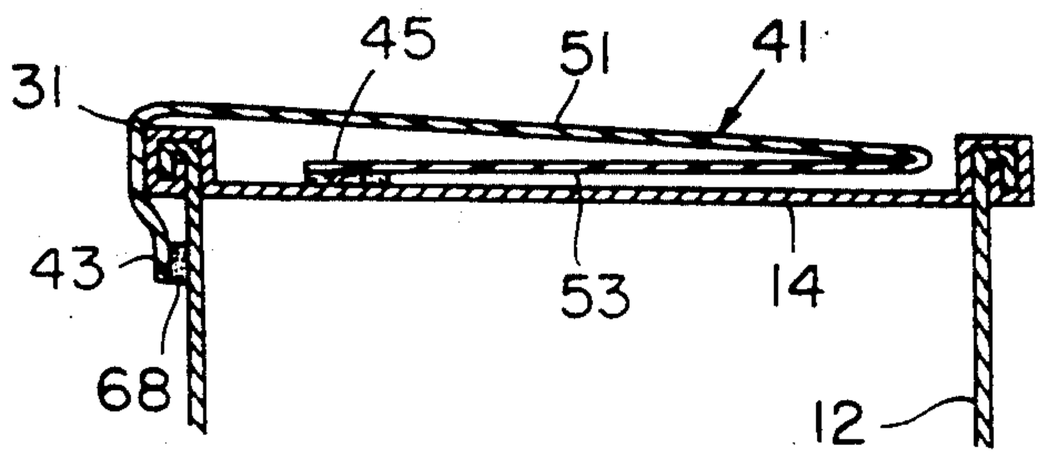


FIG. 19

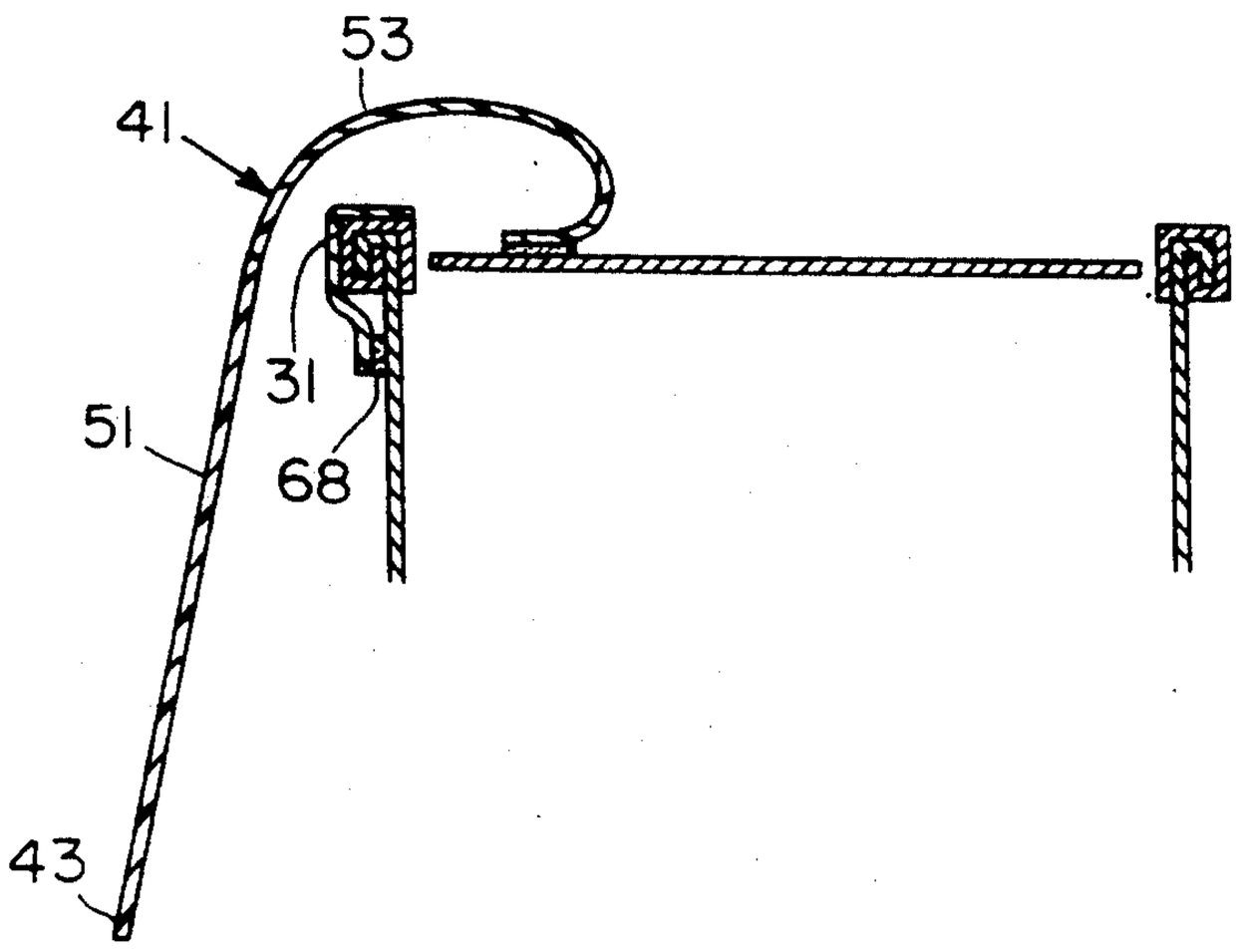


FIG. 20

CAN CONSTRUCTION

REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of copending application Ser. No. 606,564, filed Oct. 31, 1990, now U.S. Pat. No. 5,027,968.

BACKGROUND OF THE INVENTION

This invention relates to a container construction comprising a container having a sealed cover which can be manually removed from said container when the cover is severed from the container. More particularly, this invention comprises a container construction for a liquid having a cover which includes strip means which promotes ease of manual removal of the cover from the container when the cover is severed from the container prior to the cover sinking into the liquid.

Prior to the present invention, containers such as metallic or plastic containers have been provided with a cover which can be opened by hand. These containers included the construction having a "pop-top" opener handle which is formed integrally with the cover and can be lifted by hand to form an opening in the cover which is defined by a previously molded indentation in the cover. These containers have been designed either to form a centrally located opening in the cover such as is common in a beverage container or can be found to extend about the cover periphery to remove the cover, as is common in processed foods such as cheese products. The opener handles which form a central opening are not desirable for use with a liquid food product since a portion of the outside surface of the opened handle extends into the liquid and can contaminate the liquid. The handle openings which permit removal of the entire cover are expensive.

It has also been proposed in U.S. Pat. No. 2,637,465 to provide a handle which can be bent away from a can top so that the can top can be subsequently lifted away from the can after the top has been cut. This handle means is undesirable since force is required to bend it away from the can which force would force the contents onto the top after it is cut. In addition, it is expensive to produce.

It would be desirable to provide a container construction which includes a cover which can be easily manually removed from the container when the cover is severed without interfering with the container's contents such as by causing the cover to sink into the container as is in the case of liquid products such as soups.

SUMMARY OF THE INVENTION

The present invention provides a container construction with a top having a handle in the form of a strip or a plurality of strips which are covered by a severable cover. The strips are prestressed and secured to the container in a manner such that when the container top and cover are cut about their periphery when opening the container, the strip or strips, under the prestressing forces, lift away from the container top and extend over the container rim to a position where they can be easily grasped. The cover can enclose the entire top to protect the can top from dust and soil or enclose only a portion of the top which includes the strips. By extending the strips over the container rim, they can be manually grasped while avoiding exerting downward force on the opened container top. The requirement of manual force to lift the strips away from the container is eliminated so the container contents are not disturbed when the top is removed from the container. The strips are adhered to a portion of the exposed top surface while an end of each strip is rendered free from the surface when the top and cover are cut so that it can be manually grasped after the top is cut away from the container body.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a cut-away view of a container top with a cover and strip adhered to the top periphery.

FIG. 2 is a cut-away view of a container top of FIG. **1** after the cover and top have been severed.

FIG. 3 is a cut-away view of a container top with foam strips adhered to the top periphery.

FIG. **4** is a cut away view of a container top of FIG. **3** after the cover and top have been cut.

FIG. **5** is a top view of the container top of FIG. **1**.

FIG. **6** is a cut away view of a container with strips adhered to a cover.

FIG. **7** shows the container of FIG. **6** after the cover and top have been cut.

FIG. **8** shows an alternative form of this invention with one strip secured with an adhesive to the cover.

FIG. **9** shows the container top of FIG. **8** after the cover has been severed.

FIG. **10** is a cut-away view of a container with the strips adhered to the container top.

FIG. **11** is the container of FIG. **10** after the strips are cut.

FIG. **12** shows a container of this invention with one strip.

FIG. **13** shows the container of FIG. **12** after the cover is cut.

FIG. **14** shows a container of this invention with one strip.

FIG. **15** is the container of FIG. **14** after the cover is cut.

FIG. **16** shows a container of this invention with one end of the strip adhered to the container side and the other end to the top.

FIG. **17** shows the container of FIG. **16** after the strip is cut.

FIG. **18** is a top view of a container with two strips as shown in FIGS. **16** and **17**.

FIGS. **19** and **20** show an emobiment with no cover and one prestressed strip.

DESCRIPTION OF SPECIFIC EMBODIMENTS

By the term "strip" as used herein is meant an element having a flat surface such as a portion of a sheet or foam material or a curved surface such as filament which has a length such that it can be grasped manually. The strip is formed of a material which is elastic and can be prestressed so that when it is released from the forces which cause it to remain stationary, it moves, under the prestressing forces, away from the container top and over the container rim. For example, the strip can be formed of a polymeric composition such as a rubber, a solid, or a plastic foam composition, from a metallic composition, or from a plastic composite materials such as plastic-graphite, plastic-metal, plastic-glass, etc.

The container top of this invention includes one or more strips, usually a plurality of strips which are secured, at one end thereof to a central portion of the top or to a cover which extend over the strip and the top and the second end thereof being free. The cover is

secured near the top periphery so that it can be cut with a cutting tool used to open the container. Since the strip is prestressed and the first end of the strip is secured to a central portion of the top or to the cover, when the cover is cut, the strip extends over the container rim due to the prestressed bias previously imposed into the strip. It is to be understood that any means for inducing the prestressed bias into the strip can be utilized in the present invention including natural elasticity of the material and prebending. In any event, the means for adhering the strip and cover is positioned on the top surface so that a strip can extend over the container rim so that it can be be easily grasped when it is desired to remove the can top from the can body. The cross patch which has the permanent adhesive maintains the strip on the can top.

Elastic bi-compositional and multicompositional covers may be utilized over the strip and may be composed of a less shrinking bottom layer and a more-shrinking upper layer. Differential shrinking can be achieved by many means including chemical cross-linking, thermal shrinking, plasticiser loss, aging or the like.

To obtain a length-stable bottom layer of the cover, the bottom layer can be made of a suitable metal, such as stainless steel, aluminum, iron, copper alloys or a suitable dimensionally stable plastic, such as polysulfone, polycarbonate, polyimide, polyethermide or polyester. The upper layer can be formed of a shrinkable polymer that shrinks to a desired amount to give the desired pre-stressed curl to the cover such as heat treatment, including polyolefins such as polyethylene or polypropylene, polyethylene, vinyl acetate and other copolymers, polystyrene, butadiene, polyvinylidene chloride. The bottom and top layers of the cover can be co-extruded and can be laminated. Alternatively, fibers, of lower and higher thermal shrinking can be sandwiched to a polymer strip to provide the desired cover bending.

Stressing of the cover sheet also can be achieved by differential contraction of a bi-compositional sheet which has more shrinkage on the upper layer than on the bottom layer when the sheet is heated. during steam sterilization or other heat application. Multilayered sheet compositions utilizing this feature also can be used. Alternatively, a sheet of a single polymeric composition can be shrunk on the upper surface by a rapid heat pulse such shrinkage on one surface of the sheet to provide desired prestressing for sheet curling.

Curling of the cover, causing the cover to bias away from the can top, allows one to also easily grasp the cover sheet so that the can top can be easily lifted manually away from the container body by either the cover sheet or the strip.

Referring to FIGS. **1, 3** and **5**, the container **10** of this invention includes a container body **12**, a sealed top **14**, a cover **17** such as sheet plastic and strips **16** and **18**. Strips **16** and **18** are secured to a top **14** such as with an adhesive **20** or solder **20**. The cover is preferably secured to the can top **14** at **24** and container **26**. The strips **16** and **18** are prestressed so that when the cover is cut at its periphery when the can top **14** is cut about its periphery **15**, the strips **16** and **18** are biased away from the top **14** to extend over the container rim **19** and can be easily grasped while also preventing the can top from sinking into the liquid contents of the can. Thus, the top **14** can be easily lifted manually away from the container body **12** by gripping the free end of a strip **18** or the severed cover **27**.

As shown in FIG. **2**, the strips **16** and **18** are prestressed so that they extend beyond the container rim **19** after it is cut. The strips also can have ridged surfaces rather than flat surfaces to improve handling.

In an alternative construction as shown in FIG. **3**, the strips **16** and **18** are formed of a foam material and are secured to the top **14** by an adhesive **20**. The cover **17** is secured to top **14** by adhesive **24**. When the can top **14** is cut, the foam strips **16** and **18** assume the configuration shown in FIG. **4**.

An alternative strip design is shown in FIG. **6** where strips **30** and **32** are adhered to cover **17**. When the can top **14** and cover **17** are cut, the strips **30** and **32** assume the position shown in FIG. **7** so that they extend over the container rim **19**. The attachment of the strips to cover **17** may also be as shown in FIGS. **8** and **9** although the one in FIG. **6** is preferred.

As shown in FIGS. **8** and **9**, the strips **34** and **36** can be adhered to the cover **38** such that when top **37** and cover **38** are severed, the free ends **35** and **39** extend over the peripheral rim **31**.

As shown in FIG. **10**, the strip **40** and cover **44** may be adhered with adhesive **42** to can top **14** and one end cover **44** is adhered to the container **12** by adhesive **46**.

For strips attached to can top **14**, e.g., FIGS. **1,3**) attachment **24** of cover to top **14** is described but not essential.

Referring to FIG. **11**, after the cover **44** is cut, the strip **40** extends over container rim **19** to promote ease of manual grasping.

An alternate strip design is shown in FIGS. **12** and **13** where one strip is shown, although more than one strip may be used on a can top. The strip **47** is adhered to top **14** at **48** and to covers **49** and **50** at **51** and **52**. The covers **49** and **50** are also adhered to can **12** at **53** and **54**. When the covers are cut during the severing of the can top, the prestressed strips are biased away from the container top and assume the position shown in FIG. **13**, thus providing an extra long strip for easy grasping of the strip.

An alternate strip design is shown in FIGS. **14** and **15**, where one strip is shown although more than one strip may be used on a can top. The strip **55** is adhered to top **14** at **56** and to a rigid restraining cover **57** at **58** which keeps the strip restrained from biasing away from the container. When the cover is cut during the severing of the can top, the prestressed strip is biased away from the container top and assumes the position shown in FIG. **15**.

Referring to FIGS. **16** and **17**, a strip **60** is adhered to the can top **62** by an adhesive **64** at one end and at the opposite end to the container side **66** by adhesive **68**. After the can top **62** and strip **60** are severed, the free end **69** of the strip **60** can be easily grasped. As shown in FIG. **18**, two strips **60** as shown in FIGS. **16** and **17** can be adhered to the container top **62**.

Referring to FIGS. **19** and **20**, the strip **41** is secured at one end **43** to can **12** at **68** and at a second end **45** to top **14**. When the top **14** and strip **41** are cut, the end of strip **51** extends over the rim **31**. The strip **41** has two sections; a rigid section **51** and a prestressed elastic section, **53**. Securing at **68** may be with adhesive or by crimping.

It is to be understood that a first end of the strip can be adhered to the top, or when used, the cover. The second end can be free or restrained in any manner, so long as when the top is severed, the prestressing in the strip effects positioning of the strip as described above.

Although it may be more expedient to utilize a curling (prestressed) cover sheet, a non-curling conventional plastic sheet cover may also be used to keep the strips in place. The cover sheet may also be a stretched elastomeric polymer sheet, if desired.

As long as the cover can restrain the strips, it can function satisfactorily even without adhesive attachment of cover to center of can top.

It is claimed:

1. A sealed container having, a side wall, a peripheral rim and a permanently fixed top to a body having a volume containing a material, a cover positioned over said fixed top, at least one strip means positioned on said top having a first end adhered either to said fixed top or to said cover and the second end adhered to said sidewall, said at least one strip having a stress bias such that when said top is severed from said container, one end of said strip becomes positioned away from contact with said top and extends outwardly away from said peripheral rim thereby supporting said can top and preventing said top from sinking into the material.

2. The container of claim **1** which includes a plurality of said strip means.

3. The container of any one of claims **1** or **2**, wherein said strip means comprise a metallic strip.

4. The container of any one of claims **1** or **2**, wherein said strip means comprise a polymeric material.

5. The container of any one of claims **1** or **2**, wherein said strip means comprises a polymeric filament.

6. The container of any one of claims **1** or **2**, wherein said strip means comprises a metallic filament.

7. The container of any one of claims **1** or **2**, wherein said strip means comprises a composite material of polymer and non polymer fibers.

8. The container of any one of claims **1** or **2**, wherein said strip means has flat surfaces.

9. A sealed container having a side wall, a peripheral rim and a permanently fixed top to a body having a volume containing a material, a cover positioned over said fixed top, at least one strip means positioned between said top and said cover, said strip means having one end attached either to said cover or said top, said at least one strip having a stress bias such that when said top is severed from said container, one end of said strip becomes positioned away from contact with said top and extends outwardly away from said peripheral rim thereby supporting said can top and preventing said top from sinking into the material.

10. The container of claim **9** which includes a plurality of said strip means.

11. The container of any one of claims **9** or **10**, wherein said strip means has flat surfaces.

12. The container of any one of claims **9** or **10**, wherein said strip means comprise a metallic strip.

13. The container of any one of claims **9** or **10**, wherein said strip means comprise a polymeric material.

14. The container of any one of claims **9** or **10**, wherein said strip means comprises a polymeric filament.

15. The container of any one of claims **9** or **10**, wherein said strip means comprises a metallic filament.

16. The container of any one of claims **9** or **10**, wherein said strip means comprises a composite material of polymer with non-polymeric fibers.

17. The container of any one of claim **9** or **10** wherein the severable cover secured near the top periphery of said container encloses the entire top of said container.

18. The container of any one of claim **9** or **10** wherein the severable cover secured near the top periphery of said container is adhered to the center of the top.

19. The container of claim **9** or **10** wherein the severable cover comprises a polymeric sheet.

20. The container of any one of claims **9** or **10** wherein the severable cover comprises a sheet with a pre-stressed bias such that when the top and cover are severed the cover end becomes positioned away from said top and extends upwardly away from said top.

21. The cover of claim **9** or **10** is comprised of a metallic material.

22. The cover of claim **9** or **10** is comprised of a polymeric material.

23. The cover of claim **9** or **10** is comprised of a multilayered polymeric material.

24. The cover of claim **9** or **10** is comprised of a sheet of composite material of a polymer and non polymer such as polymer/metal, polymer/inorganic fiber.

* * * * *